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(54) METHODE, SERVEUR ET TERMINAL UTILISES POUR FINS DE MODIFICATION DE DONNEES STOCKEES DANS UN SERVEUR

(54) METHOD, SERVER, AND TERMINAL FOR MODIFYING SERVICE DATA STORED IN A SERVER

(57)

The invention relates to a method of modifying service data stored in a server and to a server (CS) and a terminal (TER) to carrying out this method. Using the service data stored in it, the server (CS) can provide service functions to a telecommunications terminal over a service channel (VL) . A data terminal (DT) sets up a data connection (CON) to the server (CS), and the data terminal sends to the server a request to access the service data. After reception of the access request by the server, the server and the data terminal process the data by interaction wherein the server outputs the data to the data terminal and the data terminal sends data to the server at least when a data modification was entered at the data terminal. Modified data are stored by the server. Either the server or the data terminal releases the data connection.

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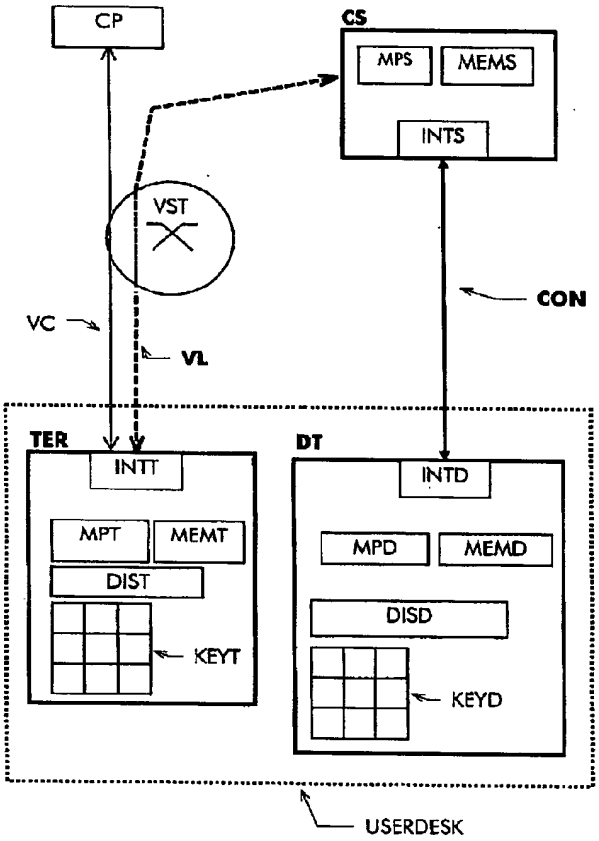
(54) **METHODE, SERVEUR ET TERMINAL UTILISES POUR FINS DE MODIFICATION DE DONNEES STOCKEES DANS UN SERVEUR**

(54) **METHOD, SERVER, AND TERMINAL FOR MODIFYING SERVICE DATA STORED IN A SERVER**




(57) The invention relates to a method of modifying service data stored in a server and to a server (CS) and a terminal (TER) to carrying out this method. Using the service data stored in it, the server (CS) can provide service functions to a telecommunications terminal over a service channel (VL). A data terminal (DT) sets up a data connection (CON) to the server (CS), and the data terminal sends to the server a request to access the service data. After reception of the access request by the server, the server and the data terminal process the data by interaction wherein the server outputs the data to the data terminal and the data terminal sends data to the server at least when a data modification was entered at the data terminal. Modified data are stored by the server. Either the server or the data terminal releases the data connection.

## Abstract of the Disclosure

The invention relates to a method of modifying service data stored in a server and to a server (CS) and a terminal (TER) to carrying out this method. Using the service data stored in it, the server (CS) can provide service functions to a telecommunications terminal over a service channel (VL). A data terminal (DT) sets up a data connection (CON) to the server (CS), and the data terminal sends to the server a request to access the service data. After reception of the access request by the server, the server and the data terminal process the data by interaction wherein the server outputs the data to the data terminal and the data terminal sends data to the server at least when a data modification was entered at the data terminal. Modified data are stored by the server. Either the server or the data terminal releases the data connection.

# Method, Server, and Terminal for Modifying Service Data Stored in a Server

This invention relates to a method as set forth in the preamble of claim 1, to a server as set forth in the preamble of claim 7, and to a terminal as set forth in the preamble of claim 8.

Terminals for telecommunications networks, particularly telephone sets, offer various functions that make it simpler or easier to operate the terminals. Many of these functions are permanently incorporated in the terminals and are immediately available, such as last number redial, whereby a previously dialed number can be repeated by a single depression of a specific redial key. Before other functions can be used, however, the terminals must be specifically programmed; for example, a multidigit number to be assigned to a name key for speed calling, with which this number can be retrieved by a single key depression, must be entered into a terminal and stored in the terminal.

More extensive and individually adaptable functions of a terminal, such as a user interface, are difficult to implement by the means of a terminal, since a terminal generally offers only a few special keys in addition to

a numeric keypad. Therefore, the individually adaptable functions of a terminal are frequently configured on a separate data processing device, such as a personal computer, which, besides being provided with a keyboard, has a graphical input aid, such as a mouse. The configured functions are then loaded as a software package from the data processing device over a connecting line into the terminal.

There are terminals, however, into which software packages can be loaded from an external source located within a telecommunications network. Such a system, consisting of a service provisioning facility and a terminal into which control data are loadable, is implemented in the product line ADSI (Analog Display Services Interface) of Alcatel Telecom. In the printed publication 3CL 00300 0001 TQZZA - Ed. 1 - DC/10/96 of Alcatel Telecom, it is described in a section entitled "Alcatel 1461" how a user with a terminal, here an Alcatel ADSI terminal with the designation "Alcatel 2595", registers with the service provisioning facility and selects there from service packages. These service packages are written in a language interpretable by the ADSI terminal, and are loaded from the service provisioning facility into the ADSI terminal. The ADSI terminal executes the functions contained in the service packages. Functions typical of an added-feature terminal adapted to the needs of a user of the terminal, such as a personal telephone directory or a display of the caller's name, must be programmed locally at the ADSI terminal, because the ADSI terminal must offer these functions without the assistance of the service provisioning facility. This is apparent from the printed publication 3CL 00301 0001 TQZZA - Ed.

2 - DC/10/96 of Alcatel Telecom, which deals specifically with the ADSI terminal "Alcatel 2595", in the sections entitled "Directory" and "Caller Identification Management". In addition, during communication with the service provisioning facility, the terminal cannot be reached by other communications facilities ("partners"). During that time, the functions of a telephone are not executable with the terminal.

There are other terminals which - even while a call is in progress - can be in direct contact with an associated server over a data connection and, together with the respective associated server, provide telecommunications services. The server may either be located somewhere in a telecommunications network and preferably be connected to the terminal via a virtual, packet-oriented connection or be inserted in a data connection between the terminal and the telecommunications network, for example into a connection between the terminal and a local exchange serving the terminal. The server determines the name of a caller from the number transmitted in a calling line identity (CLI) message and then communicates this name to the terminal for display. The server also may contain a customer-specific telephone directory whose entries can be searched and retrieved by the customer with the aid of the terminal. Such configuration data of the server for providing telecommunications services are difficult to create by the means of the terminal, such as a numeric keypad or a simply display. Therefore, these data are modified directly at the server by specifically trained operating personnel that

modifies the data according to instructions given by a user of the terminal, e.g. by telephone.

It is an object of the invention to modify data stored in a server, with which the server can provide telecommunications services in cooperation with a telecommunications terminal, in a convenient manner.

This object is attained by a method according to the technical teaching of claim 1, by a server according to the technical teaching of claim 7, and by a terminal according to the technical teaching of claim 8. Further advantageous aspects of the invention are apparent from the dependent claims and the description.

The idea underlying the invention is to set up a data connection from a data terminal to a server containing data with which the server, in cooperation with a telecommunications terminal, can provide functions. These data are then modified at the data terminal in interactive communication with the server. After that, the data connection is released, and using the modified data, new functions can be provided or already defined functions can be used in modified form at the telecommunications terminal.

Advantageously, access to the data of the server is strictly controlled, so that only an authorized user can manipulate the data. The data connection is established either through an on-line telecommunications network, such as the Internet, or through a telecommunciations network for telephony, such as an integrated services digital network (ISDN).

The invention and its advantages will become more apparent from the following description of an embodiment taken in conjunction with the accompanying drawings, in which:

Fig. 1 shows an arrangement for carrying out the method according to the invention, comprising a server (CS) according to the invention and a data terminal (DT) according to the invention that are interconnected via a data connection (CON); and

Fig. 2 shows the arrangement of Fig. 1, supplemented with an on-line data network (ODN).

Fig. 1 shows an exemplary arrangement for carrying out the method according to the invention. A connection VL, indicated by a heavy dashed line, links a terminal TER with a server CS. The terminal TER contains a central control unit MPT for controlling the functions of the terminal TER, a display device DIST for visualizing information, a keypad KEYT for operating the terminal TER, and a memory MEMT containing data for basic functions and data for special functions. The terminal TER further includes an interface device INTT, which serves to establish communications links. The components of the terminal TER are interconnected by connections not shown in Fig. 1.

A telecommunications network is symbolized in Fig. 1 by an exchange VST. The telecommunications network may also comprise further nodes and trunks. It may also be a mobile radio network, and the terminal TER may be a terminal suitable for such a network.

The server CS exemplifies a data-providing facility that can make data available to the terminal TER. It can be a single computer or a network of interconnected computers. Of the components of the server CS, a controller MPS, a memory MEMS, and an interface device INTS are shown by way of example. The controller MPS may be, for example, a single processor or a group of processors that execute instruction sequences stored in the memory MEMS. The memory MEMS additionally contains data with which functions can be provided at the terminal TER. Besides serving the terminal TER, the server CS may supply data to further, similar terminals (not shown in Fig. 1).

A connection VC, which also runs through the exchange VST, for example a B channel of an ISDN connection, links the terminal TER with a communication partner CP, e.g. another terminal. The terminal TER incorporates the basic functions of a telephone set, such as dialing, voice input and voice output. The means necesary for voice input and voice output, microphone and loudspeaker, are not shown in Fig. 1 in order to simplify the illustration. In addition, after loading of data, the terminal TER may offer further special functions, such as the presentation of special information on the display device DIST or a specific layout of the same. After the terminal TER has received data necessary for special functions from the server CS, the special functions can be either executed by the control unit MPT immediately after reception or stored in the memory MEMT for later use.

Over the connection VL, the terminal TER can exchange data with the server CS. The connection VL can exist before, after, and during a connection VC to the partner CP, and is independent of the connection VC to the partner CP. In this manner, the terminal TER can be supplied with data from the server CS at any time. The connection VL may be a voice link on a separate subscriber line, or the connection VC and the connection VL together use a subscriber line on one channel each. The channel for the connection VL may be, for example, a control channel of a mobile radio network, a D channel on an ISDN subscriber line, or an in-band signaling channel that is independent of the channel used for the connection VC. The connection VL may also be implemented as a virtual, packet-oriented data connection.

Fig. 1 further shows a data terminal DT, from which a data connection CON exists via an interface device INTD and the interface device INTS to the server CS. The data connection CON can be established as a telephone connection, such as a DATEX-P connection or a D channel of an ISDN, or it is a connection through an on-line data network, such as the Internet. The various ways to set up the data connection CON are discussed later. The data terminal DT comprises a controller MPD, e.g. a processor, a memory MEMD containing, among other things, programs executable for the controller MPD, a display device DISD, such as a screen or a liquid crystal display (LCD), and an input device in the form of a keyboard KEYD. The components of the data terminal DT are interconnected by connections not shown in Fig. 1. As a further input device, the data terminal DT may have a mouse, so that in cooperation with the keyboard

KEYD and the display device DISD, GUI user prompting (GUI = Graphical User Interface) becomes possible at the data terminal DT. The data terminal DT may be a personal computer, for example.

After having set up the data connection CON to the server CS, the data terminal DT sends to the server CS a request to access the service data with which the server CS can provide the service functions to the terminal TER. As the access request, the subscriber number assigned to the terminal TER may be sent, for example.

Advantageously, the server CS checks the access request to determine whether it can permit access to the service data of the terminal TER. In connection with the access request, a personal identification number (PIN), for example, may be sent from the data terminal DT to the server CS. Only if the PIN entered at the data terminal DT is identical with a PIN expected by the server CS in connection with the access request will the server CS permit acces to the service data. This ensures that only an authorized subscriber or his substitutes can access the service data. It may also be predetermined, however, that the mere entry of the number of the subscriber terminal suffices to obtain access to the service data. The latter variant may be chosen, for example, if the service data are to be only read, not modified, or if the service data are only modifiable to a very limited extent.

If access to the service data cannot be permitted, the server CS will notify this to the data terminal DT. Then, either a new access attempt can be made at the

data terminal DT with a different access identification, e.g., with a different PIN, or the connection between the server CS and the data terminal DT will be released.

If the subscriber at the data terminal DT has been given access to his service data, the server CS and the data terminal DT will process the service data in an interactive mode. The server CS sends service data to the data terminal DT, which can then output this data on an output medium, e.g., on the display device DISD or through a loudspeaker (not shown in Fig. 1). If the data are modified at the data terminal DT via an input medium, such as the keyboard KEYD, the data terminal DT will send the modified data to the server CS. The server CS stores the modified data in its memory MEMS. It is also within the scope of the invention, however, that the data are only read by the data terminal DT, not modified.

By modifying the service data, settings of service functions provided by the server CS for the terminal TER can be changed. For example, additional service functions are requested, or in the case of service functions that have already been booked, the operating parameters are changed. A service function of the server CS may be, for example, that the server determines the name of a caller associated with a number received from the terminal TER over the connection VC within a calling line identity (CLI) message. The terminal TER forwards the CLI message over the connection VL to the server CS, which then sends the caller's name over the connection VL to the terminal TER for presentation on the display device

DIST. This service function for the terminal TER can be created with the aid of the data terminal DT.

A further service function will now be described to illustrate the interaction of the server CS and the terminal TER. Using the data of the server CS and in response to preceding operating steps of a user, the terminal TER can change the assignment of functions to the keys of the keypad KEYT, which can be called up by depressing respective keys at the terminal TER. The current key assignment is then visualized on the display device DIST, for example by presentation of symbols or texts. On depression of a key of the keypad KEYT, the terminal TER sends a corresponding message to the server CS, which replies with data for providing these service functions. These data may contain instruction sequences, for example, which are loaded from the memory MEMS into the memory MEMT and subsequently executed by the controller MPT. In the instruction sequences, a particular type and design of the display on the display device DIST may be specified. A menu mode is thus available to the user, which is adapted with the data from the server CS to the current situation. Thus, the functions of the terminal TER are offered to the user through the interaction of the server CS and the terminal TER. Such a service function, like other service functions not mentioned here, can be booked at the server CS via the data terminal DT.

If a service function has already been booked, the operating parameters for this service function can be adapted to current requirements from the data terminal DT. For the above-mentioned conversion of a CLI message

to a message containing the name of the caller, the server CS will generally determine the caller's name from a telephone directory accessible to the public. However, it may also be desirable, for example, that a caller should be identified at the terminal TER not by his or her "official" name, but by his or her pet name or by his or her position within a family. Then it can be fixed in the server CS via the data terminal DT that in the case of a call from a friend, "Frank" instead of "F. Mustermann" will appear on the display device DIST, and that in the case of a call from mother, "Mother" instead of, e.g., "Anna Schmidt" will be displayed.

The memory MEMS of the server CS also may contain a customer-specific telephone directory whose entries can be searched and retrieved from the terminal TER. In the interest of better central maintenance and for lack of capacity of the memory MEMT, such a directory is stored not in the terminal TER, but in the server CS. Using the data terminal DT, particularly the above-mentioned GUI prompting, such a directory can be easily and conveniently modified, e.g., updated.

Advantageously, the data terminal DT sends only permissibly modified data to the server CS by checking prior to the sending whether the data modification is permitted. The server CS, in turn, can check the received data for plausibility and store only those data into the memory MEMS which stand the plausibility check. Maximum security is achieved if both the server CS and the data terminal DT perform such validation.

After the data modification or only a data inspection has been successfully completed, the data terminal DT

releases the data connection CON with the server CS. The data connection CON may also be released by the server CS, for example if no input is made at the data terminal DT over a prolonged period of time, so that connection capacity of the server CS is blocked for an unnecessarily long time by the unused connection to the data terminal DT, in which case a timeout facility in the server CS will initiate the connection release.

All communication over the data connection CON between the data terminal DT and the server CS, particularly the communication in connection with the access request and the associated authorization check, can be protected against unauthorized monitoring and manipulation by encryption.

In the embodiment described so far, during the interactive processing of the service data, the server CS can send only service data as such to the data terminal DT, which are then interpreted by the data terminal DT and displayed to a user of the data terminal DT in a menu. In the opposite direction, the data terminal DT then sends to the server CS only the aforementioned access identification and PIN, requests for service data, user inputs, or modified service data. In that case, the interpretation of received service data, the presentation in menus, and, if necessary, the check of data entered at the data terminal DT are performed by the data terminal DT using software permanently installed in and fetchable from the memory MEMD. Such software can also be loaded from the memory MEMS of the server CS into the memory MEMD of the data terminal DT prior to processing the service data.

In a further variant of the invention, it is also possible for the server CS and the data terminal DT to exchange service data enriched with additional instructions for the interpretation. The server CS then sends the service data to the data terminal DT together with an additional instruction for display buildup or an additional instruction for voice output of the data, for example. Thus, the form of output at the data terminal DT is controlled directly by the server CS, and both changes to and extensions of the form of output come from the server CS and are no longer dependent on software permanently installed on a storage medium of the data terminal DT. The data terminal DT then comprises means for interpreting the instructions sent by the server CS.

Particularly if the data connection CON runs through the Internet, the last-mentioned exchange of extended data between the server CS and the data terminal DT can be accomplished using the HyperText Markup Language (HTML). The server CS then sends to the data terminal DT so-called HTML documents, which consist of a sequence of ASCII (American Standard Code for Information Interchange) characters and are read and interpreted by the data terminal DT using a specific interpretive program, the so-called browser. The syntax of the HTML documents is precisely defined and makes it possible, for example, to describe the type of the written presentation of pages or entire acoustic sequences using the HTML language. The data terminal DT can edit received service data on input fields of a displayed page, so that the user of the data terminal

DT can modify the displayed data and the data terminal DT can send the modified data back to the server CS.

As a further development of the possible descriptions of information using HTML documents, the language JAVA offers extended possibilities for the output of data and particularly for interactive data modification. If JAVA is used, the server CS sends an intermediate code generated from a compiled source text, a so-called JAVA applet, to the data terminal DT, which translates this JAVA applet into machine code using a JAVA interpreter and subsequently executes the machine program thus generated, i.e., generates image sequences, acoustic sequences, or input masks for service data. Since communications means of the Internet protocol family TCP/IP (Transmission Control Protocol/Internet Protocol) can be incorporated into the JAVA applets, the retransmission of modified or unmodified service data or of control commands from the data terminal DT to the server CS is considerably simplified.

Furthermore, the server CS can be instructed via the data terminal DT to generate executable programs or program modules, e.g., so-called macros, and to load these over the connection VL into the terminal TER. The terminal TER stores these programs in its memory MEMT and can fetch the programs from its memory MEMT at any time and execute them in the control unit MPT for the provisions of functions. However, since the connection VL from the terminal TER to the server CS can exist simultaneously with the connection VC to the partner CP, the terminal TER can simultaneously load data for service functions from the server CS and offer communication with the partner CP. Thus, the terminal

TER can be reached over the connection VC even during a download.

The server CS can offer programs or program modules e.g. in the form of symbols, so-called icons, on the above-mentioned GUI for selection by a user of the data terminal DT. The user then determines which programs or program modules are loaded, singly or in combination, from the server CS into the terminal TER for temporary use or for permanent storage in the memory MEMT.

The terminal TER and the data terminal DT may be situated in different places. Thus it is possible to set up a data connection CON from any place to the server CS and modify service data stored therein. In Fig. 1, however, it is indicated by a dash-dotted box USERDESK that in this example, the data terminal DT and the terminal TER are colocated.

The terminal TER may also be a combination terminal that can provide the functions of the terminal TER and the above-described functions of the data terminal DT in cooperation with the server CS. Such a combination terminal can, for example, provide the functions of a telephone set over the connection VC, load data for special functions, and additionally communicate over the data connection CON with the server CS for data manipulation. In that case, the control unit MPT additionally performs the functions of the control unit MPD, the display device DIST additionally performs the functions of the display device DISD, the keypad KEYT additionally performs the functions of the keyboard KEYD, the memory MEMT additionally performs the functions of the memory MEMD, and the interface device

INTT additionally performs the functions of the interface device INTD. The combination terminal may be, for example, an added-feature telephone like the terminal TER, which is also suitable for communication with the server CS for data manipulation. Also, a personal computer can be equipped with input and output means, such as a microphone and a loudspeaker, and with software suitable for high-convenience telephony like the terminal TER, and additionally permit data manipulation in a similar manner as the data terminal DT.

The combination terminal can set up the data connection CON and the connection VL successively or simultaneously on a common channel, such as the above-mentioned D channel, or on separate channels, such as a B channel and a D channel of an ISDN subscriber line. In both alternatives, the combination terminal can communicate with the partner CP while implementing a data modification in cooperation with the server CS. It is also possible, however, that during such a data modification, the combination terminal cannot be reached by the partner CP, for example because a B channel is being used for a data connection CON and no further B channel to the combination terminal is available to the partner CP.

One way of setting up a data connection to the server CS through an on-line data network is illustrated in Fig. 2, which contains essentially the same elements as Fig. 1. In addition, however, Fig. 2 shows an on-line data network ODN, e.g., the Internet. When the data terminal DT and the terminal TER are using a common subscriber line, the data terminal DT can set up a

connection DC1 to the on-line data network ODN through the exchange VST and further equipment (not shown in Fig. 2) of a telecommunications network. In Fig. 2, the connection DC1 is a telephone connection to a gateway (not shown) of the on-line data network ODN, i.e., an interface between the telecommunications network and the on-line data network ODN. The data terminal DT can then exchange data with the on-line data network ODN over the connection DC1, e.g. via a modem or an ISDN interface card. A modem will be used if the connection DC1 permits only analog transmission, and an ISDN interface card if the connection DC1 permits the transmission of digital ISDN data packets. If the on-line data network ODN is the Internet, the establishment of the connection DC1 from a data terminal DT in the form of a personal computer using suitable interface software is generally known. Devices in the on-line data network ODN, particularly a server and a router (not shown in Fig. 2), then complete the path to the server CS, including the connection DC2 between the on-line data network ODN and the server CS. Particularly if the on-line data network ODN is the Internet, the connection setup between the data terminal DT and the server CS is very simple. The server CS is assigned a so-called URL (Uniform Resource Locator) address, which only needs to be entered at the data terminal DT to establish the connection. With this URL address, it is possible in the Internet to establish a connection from the data terminal DT via the aforementioned gateway and the interface device INTS to a so-called home page of the server CS. This home page is then written in the aforementioned HTML language and permits the manipulation of service data.

In a further constellation, which is not illustrated by a figure, the server CS may be inserted in a connection between the exchange VST and the terminal TER. This connection may be, for example, a D channel of a subscriber line which is routed through the server CS. Over this connection, as over the connection VL, the server CS can load or manipulate data to influence the functions of the terminal TER.

## Patent Claims

1. A method of modifying service data stored in a server (CS) and usable by the server (CS) to provide service functions to a telecommunications terminal (TER) of a subscriber over a service connection (VL), comprising the following steps:
   - A data terminal (DT) sets up a data connection (CON) to the server (CS);
   - the data terminal (DT) sends a request to access the service data to the server (CS);
   - the server (CS) receives the access request;
   - the server (CS) and the data terminal (DT) process the data by interaction wherein the server (CS) outputs the data to the data terminal (DT) and wherein the data terminal (DT) sends data to the server (CS) at least when a data modification was entered at the data terminal (DT);
   - the server (CS) stores modified data; and
   - the server (CS) and the data terminal (DT) release the data connection.

2. A method as claimed in claim 1, characterized in that prior to the processing of the data, the access request is checked to determine whether the subscriber has an access authorization for the data.

3. A method as claimed in claim 1, characterized in that the server (CS) additionally sends to the data terminal (DT) interpretable instructions to output and process the service data.

4. A method as claimed in claim 1, characterized in that the data connection (CON) is set up through an on-line data network.

5. A method as claimed in claim 4, characterized in that the data connection (CON) is set up through the Internet.

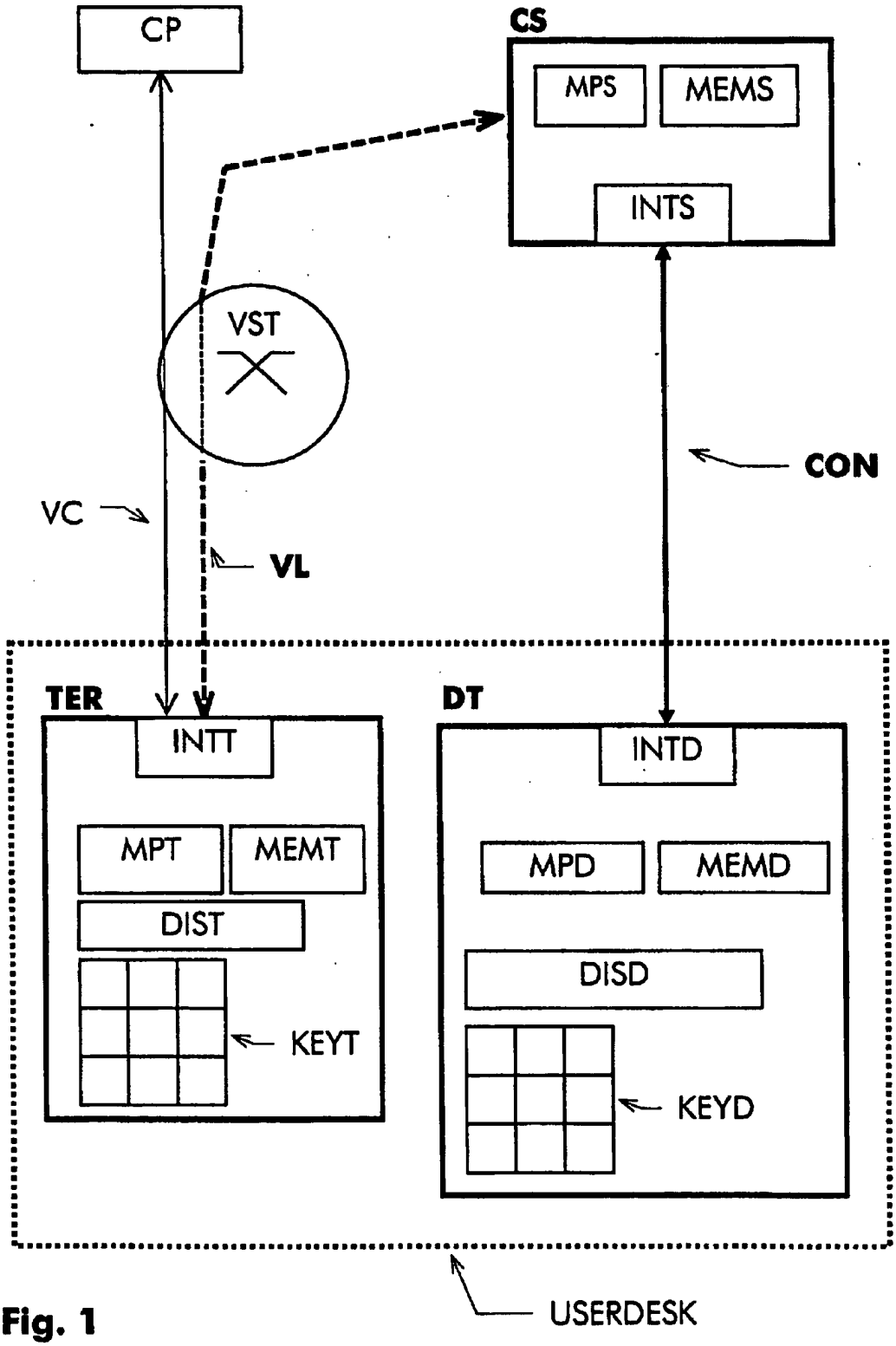
6. A method as claimed in claim 1, characterized in that the data connection (CON) is set up through an ISDN telecommunications network.

7. A server (CS) which stores service data with which the server can provide service functions to a telecommunications terminal (TER) over a service connection (VL), **characterized in** that the server (CS) comprises communications means designed to enable the server to be connected via a data connection (CON) to a data terminal (DT) of a subscriber, that the server further comprises receiving means designed to enable the server to receive a request entered by the subscriber at the data terminal to access the service data, that the server further comprises output means designed to enable the server to output data to the data terminal, that the server further comprises data-receiving means designed to enable the server to receive data from the data terminal, and that the

server further comprises storage means designed to enable the server to store data or modify stored data at least when a data modification was entered at the data terminal.

8. A terminal (TER) for a telecommunications network, comprising devices for providing functions at the terminal (TER), which can provide the functions over a service connection (VL) using service data received from a server (CS), **characterized in** that the terminal comprises communications means designed to enable the terminal to set up a data connection to the server, that the terminal further comprises sending means designed to enable the terminal to send a request to access the service data to the server, that the terminal further comprises processing means designed to enable the terminal and the server to process the service data by interaction wherein the server outputs the service data to the terminal and wherein the terminal sends service data to the server at least when a data modification was entered at the terminal, and that the terminal further comprises means designed to enable the terminal to release the data connection.

9. A terminal as claimed in claim 8, characterized in that the communications means are designed to enable the terminal (TER) to set up the data connection (CON) and the service connection (VL) on a common channel.


CP
CS
MPS
MEMS
INTS
VST
CON
VC
VL
TER
DT
INTT
INTD
MPT
MEMT
MPD
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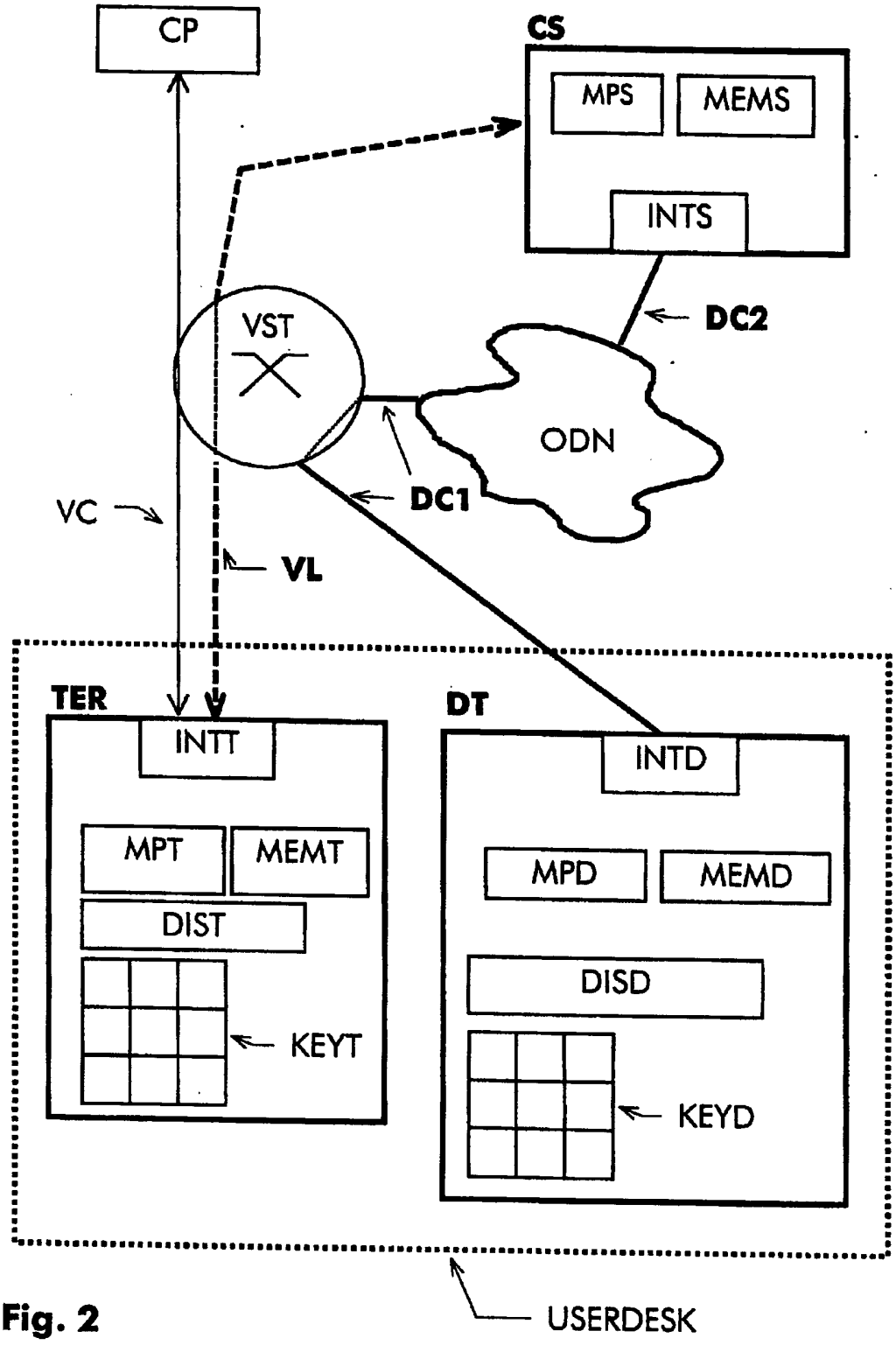
DIST
DISD
KEYT
KEYD
USERDESK

Fig. 1


CP
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INTS
DC2
VST
ODN
DC1
VC
VL
TER
INTT
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KEYT
DT
INTD
MPD
MEMD
DISD
KEYD
USERDESK

Fig. 2